ROBYN BARNACLE, JENNIFER SINCLAIR AND DENISE CUTHBERT*

8. INDEPENDENCE INTERRUPTED: CREATIVITY, CONTEXT AND THE 'INDEPENDENT SCHOLAR'

ABSTRACT

Social and networked conceptions of creativity highlight the key role of collaboration and connection making in the work involved in creating and imagining new knowledge. With governments around the world keen to harness the potential of research to foster innovation and economic growth, the question arises as to whether the research degree experience is preparing graduates to be creative, or mobilise creativity, in this way.

In this chapter we explore this issue through examining the persistent figure of the "independent scholar" in accounts of research education and practice. We draw on preliminary analysis of data collected on the role of the doctorate in mid-career research success based on a survey of Australian Research Council Future Fellowship recipients. Our analysis focuses on responses to two open ended questions concerning: a) to what respondents' attribute their mid-career research success, and b) the extent to which the PhD experience provides preparation for a research career. We identify intriguing tensions and contradictions in the ways in which being and becoming a successful researcher are conceived. Most notably, the findings suggest that success can be achieved through different modes of working – and being trained – as a researcher. These have implications for universities seeking to promote researcher collaboration and creativity.

INDEPENDENCE, COLLABORATION AND CREATIVITY

The recent discovery – or near discovery - of the Higgs boson highlights the collaborative nature of science and the difficulties of attributing 'discoveries' to an 'autonomous' creative individual. An article in the Guardian considering who might win a Nobel prize for the Higgs boson, noted that 'thousands of people, carried out the painstaking work of spotting traces of the particle amid the subatomic debris of more than a thousand trillion collisions inside the Large Hadron Collider' at CERN (the major research laboratory for the project). In addressing the issue of attribution for the discovery, the article went on to argue that 'all deserve credit for that effort' (Sample, 2012). The Higgs boson story interests us in that it epitomises a contradiction: that knowledge is more frequently produced through collaboration, while socially and culturally knowledge continues to be framed and understood as the product of the efforts of 'autonomous', 'independent' researchers.

In the contemporary context, collaborative knowledge production is more explicitly than ever demanded by research funding bodies such as, in Australia, the Australian Research Council, in the design of research projects. In the words of Johnson, Lee and Green: 'Research training to produce scholars able to work in these new ways will require students to develop sensitivities to the concerns of others, a willingness to work with others, and a capacity to reason or make judgements on the basis of contextual information rather than relying purely on abstract, universalising principles' (2000: 146). Despite this, the notion of independence persists and figures strongly in doctoral education discourse and practice. As Johnson, Lee and Green (2000) have also argued, 'licensing' to become a researcher, in the form of the awarding of a Doctorate, is a 'relentlessly individualized' phenomenon that implicitly and explicitly promotes autonomy and independence as desirable outcomes and 'marks' of a researcher. More recently, this has been reinforced through work by scholars such as Barbara Lovitts (2005; 2008) which has sought to establish and demarcate more clearly what differentiates the independence required of a successful research degree scholar from that involved in course-work degrees. Such a conception is echoed in statements by, for example, the U.S. Council of Graduate Schools, that doctoral completion "…marks the transition from student to independent scholar" (in Lovitts, 2008: 296). The significance of independence is also evident in the criteria universities ask doctoral examiners to use in making their assessment; whether or not, for example, the candidate has sufficiently demonstrated capacity to undertake

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independent research. Just what being an independent researcher means, however, is often left unexplained; it is assumed that examiners will know. A more qualified account is offered by the Australian Qualifications Framework, Australia's policy for the regulation of qualifications. It states that graduates of doctoral degrees will demonstrate the application of knowledge and skills with, amongst other things, 'intellectual independence' (TEQSA, 2011: 17). Whether the notion of independence is used in isolation or qualified, however, it invariably denotes 'being on', or 'doing things on', one's own. The Macquarie dictionary defines independence in research as that which is "…not influenced by the thought or action of others" (2000: 572). Taken literally, this would not only be undesirable in research but also impossible given that all inquiry and knowledge creation, necessarily, builds on the knowledge and ideas of others. It is perhaps more meaningful to say that researchers should be independent in the sense that they are not *unduly* influenced by others, or have sufficient judgement to think about things for themselves. Note, however, that this sense of independence does not necessarily require, or even imply, the absence of others in the judgement forming process. Instead, what it requires is the ability to discern whether our ideas have been excessively, inappropriately or unjustifiably influenced by others. This suggests the need for a more sophisticated conception of independence in research; one, in particular, that does not conflate independence with autonomy, and the self-sufficiency that autonomy implies. Moreover, given the demand for collaborative and creative knowledge workers it is timely to investigate whether researcher independence is conducive or otherwise to such aims.

CREATIVITY, COLLABORATION AND INDEPENDENCE IN RESEARCH

Multiple contradictions and tensions are evident in discourses surrounding the relationship between creativity, collaboration and independence in the contemporary research and research education environment (Walsh, 2011; Araya & Peters, 2010; Lovitts, 2008; McWilliam, 2008). Lovitts, for example, examines the conditions for creativity in the transition to independent research through the doctorate. Curiously, however, this work does not address the question of whether or not the emphasis on independence is conducive to creativity (2008). Elsewhere, however, creativity has a mixed status in the research context. Walsh et al (2011) note that there are both positive and negative discourses about creativity in STEM (science, technology, engineering and mathematics disciplines) research environments. On the one hand, creativity is associated with or recognised as capital, on the other hand, creativity figures negatively as a liability in research environments focussed on 'measurability, cost-effectiveness and impact' (McWilliam, 2008: 4). Indeed, research is rarely recognised as a creative enterprise, particularly in the sciences (Wiggins: 2012), despite the fact that by contemporary definitions of creativity such as 'a capacity to adapt or recombine ideas for novel purposes' (McWilliam 2008: 18), all research is fundamentally and by its very nature creative, although there are undoubtedly research projects that are more or less creative by this definition.

ABOUT THE STUDY

The data discussed here are derived from a larger research project examining the enduring impact of the doctoral experience on later research careers and its influence on shaping and contributing to a successful research career. For a detailed analysis of the findings of the study see Sinclair, Cuthbert and Barnacle (in press). The initial phase of the study comprised a literature review (see Sinclair, Barnacle and Cuthbert, in press) and online survey of 232 Future Fellowship recipients (approximately 44% of the population). The Future Fellows scheme is of particular interest to us because it provides an independent measure of what it means to be a successful, mid-career researcher (ARC, 2012). Thus, its recipients are an ideal cohort for examining questions such as the role and significance of independence and creativity in researcher success.

In its account of the scheme, the ARC emphasises that awards are made to 'outstanding Australian and international researchers in the middle of their career.' The definition of 'mid-career' is fairly generous in the ARC eligibility criteria as someone between five and fifteen years post-PhD. Of relevance is that the scheme favours researchers with the potential to collaborate, that is, preference is given to 'those researchers who can demonstrate a capacity to build collaboration across industry and/or research institutions and/or with other disciplines.' The scheme runs from 2009-2012 with 200 Future Fellowships awarded annually. Data for this analysis was collected from those awarded Future Fellowships in the 2009, 2010 and 2011 funding rounds.

ABOUT THE SAMPLE

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Reflecting the mid-career profile of the scheme, 42% of the Future Fellows in our sample are under 40 years of age and 48% are aged between 41 and 50. Thus, most finished their PhDs when they were under 30. In terms of the disciplinary background, most are from the natural and physical sciences: 178 or (76%) of the sample work in the natural, biological or physical sciences, while 53 (22%) work in the social sciences and humanities. This reflects Australian Government research priorities since the 1990s. Just over a third of the sample received their PhDs from four Australian research intensive universities – known as the Group of Eight. A further third of the cohort (77 or 33%) graduated from non-Australian universities. In regards to gender, 147 (63%) of the sample are men, while 86 (37%) are women.

FINDINGS

In the analysis presented here we report on open-ended responses to two questions that formed part of the survey:

1. To what do you attribute your success as a mid-career researcher? and
2. To what extent did your PhD experience provide preparation for a research career?

Our analysis of participants' responses to these questions has been undertaken using a broadly phenomenological approach that comprises mapping variations in the ways in which the phenomena under analysis are discussed in survey responses. Through a process of differentiation and accretion, the variations are then consolidated into categories of description (see Bowden & Green, 2005).

As the population of our study have proven themselves to be nationally competitive successful researchers it is unsurprising that the majority of respondents (72%) reported that their PhD experience prepared them to 'a great extent' for a research career (23% responded that it had prepared them 'to some extent' and only 1% 'not at all'). After all, this is the purpose of the doctorate: training for a research career. This overall satisfaction, however, conceals distinctive – and potentially dramatic – differences in the research training and ongoing research experience. Success has been achieved through vastly different modes of working – and being trained – as a researcher. These differences become evident in the ways in which independence is conceived, both in terms of accounting for research success and the role of the PhD as preparation for a research career. These we explore in turn below.

INDEPENDENCE AND RESEARCH SUCCESS

The first frame through which we analyse conceptions of independence is through analysis of answers to the open-ended question: to what do you attribute your success as a mid-career researcher? Before introducing a typology of independence and research success we first explain the three key concepts that arose in our findings: independence, collaboration and creativity.

Independence

The vast majority of respondents refer either implicitly or explicitly to the notion of independence. This occurs in two broad ways; in dispositional terms and in the absence of contributions from others in their accounts. When conceptualised in dispositional terms, it is possible to find allusions and references to independence in accounts of hard work, perseverance, and determination. This conceptualisation relates not so much to a capacity to work alone as to having the internal resources and fortitude to 'stay the course'. When we find independence conceptualised in terms of the absence of others it is in accounts of what might be called the 'autonomous researcher;' that is, where there is no mention of the contribution of others in accounts of research success.

Collaboration

Collaboration is explicitly mentioned by successful researchers with regard to their research success. This can take various forms, including: family support, mentoring, great research environment, mentorship, partnerships, collaborative projects, networks with other researchers, collegiality, supportive senior colleagues and the like.

Creativity

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Allusions to creativity are made in a variety of ways: as novelty, as thinking and ideas, as risk-taking, as freedom and independence; as passion and curiosity; as 'love' or 'passion' for work. Further research are required to understand the relationship between creativity and 'love' and 'passion' for research, which appear frequently in answer to the question of to what do you attribute your research success. For the purposes of this analysis, however, these are taken to indicate creativity in Teresa Amabile's sense of creativity as 'an affectively charged event' (2005: 367).

Independence and researcher success: A typology

Through our analysis of these responses we have developed a provisional typology of the relative saliency of independence as contributing to researcher success. This typology is based on the multiple combinations in which notions of independence, creativity and collaboration appear or are implied in accounts of success.

3. The Lone Rangers - Independence only
4. The Connected Independents - Independence and collaboration
5. The Autonomous Creatives - Independence and creativity
6. The Adaptable Creatives - Independence, collaboration and creativity
7. The Connected Creatives - Creativity and collaboration
8. The Interdependents – Collaboration

Indicative examples of each category appear below.

Independence only

We call this category the 'lone rangers' as mid-career researcher success is entirely attributed to individual effort. There is no mention of others. Interestingly, in this example there is also no mention of the self; the point is made in entirely abstract terms.

> Motivation. Motivation to complete experiments (this includes always staying back to just get that one last thing finished). Motivation to solve the right question with the right experimental design. Motivation to make sure the data set is complete - no sloppiness and casually leaving bits out. And motivation to publish as it is what really counts in my field and therefore the only way to keep funding the work so you can keep doing the work.

Independence and collaboration

We call this category the 'connected independents' as reference is made to both independence and collaboration. The example below moves from the cataloguing of abstract qualities needed for success to a more personal and interpersonal account.

> Strong determination, attention to details (can't do good science without this), understanding of the hot topics in different fields worth working on and how to apply my special skills to them, a lot of networking/communicating/meeting people and a large number multi-disciplinary collaborations (also thanks to my supervisors who had them to start with).

Independence and creativity

In this category, success is conceptualised in terms of both independence and creativity. In this example, the abstraction evident in the previous categories is absent and instead the conceptualisation is made in the first person - also with the inclusion of an affective verb.

> I enjoy research and writing. I work hard (I was a mature age PhD student and worked hard at my thesis). I am creative but also tenacious and I value empirical substance. I have sometimes taken risks - e.g. in resigning from a tenured lecturing position to take up a research fellowship.

Independence, collaboration and creativity

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The ‘adaptable creatives’ category appears to encompass all three notions: independence, collaboration and creativity.

> Determination, love of what I do: motivated by solving puzzles, buzz of discovering something new, hooking into the global community, doing a postdoc OS, being part of a successful program of research, being in a great research environment, good mentoring, access to good students for a start.

Creativity and collaboration

We call this category the ‘connected creatives’ since, as the quotation below demonstrates, having new ideas is couched entirely in terms of working with and alongside others.

> Great collaborators and an open mind. Since my PhD I've opened my mind to different problems and spent time talking with people from apparently different fields. Great researchers are always open to new ideas, and I've been fortunate to work with a few, both my age and more senior. They are people I enjoy being with, talking about anything in particular, so doing work together is a great joy.

Collaboration

Finally, we label this category the ‘interdependents’ as success in research is conceptualised entirely in collaborative terms. This is evident in the slippage in the quotation below between first person plural and first person singular pronouns.

> I think a lot of it is the result of working in medical research. This has enabled us to publish regularly, obtain funding for our work, and for me to build multiple collaborations because other researchers are interested in what we are trying to achieve.

This typology offers insight into the ways in which notions of independence, creativity and collaboration inhere within successful researchers’ accounts of their success. It provides a spectrum from the purely solitary, lone researcher, to the entirely collaborative, connected researcher, with variations in-between. If nothing else, it suggests that successful researchers work effectively in multiple ways. In regards to creativity, it is worth noting at this stage that while it is not exclusively present in the collaborative part of the spectrum it does tend to figure more in connection with collaboration. Moreover, it is also worth noting that working autonomously only appears in two of the six categories of description.

THE PHD AND INDEPENDENCE

As discussed, independence has varying degrees of saliency in accounting for researcher success. The question arises as to whether independence is similarly conceptualised in accounts of the effectiveness of the PhD as preparation for a research career. Our findings reveal both convergence and divergence with the ways independence is conceptualised in accounting for researcher success. We identified three categories of description concerning researcher formation:

1. the skilled researcher – Independence as disposition – Independence as disposition acquired without reference to the conditions of the experience (ie; neither autonomous nor collaborative)
2. the skilled, autonomous researcher – Independence as disposition acquired from the experience of ‘being on your own’ - either by neglect or design
3. the skilled, collaborative researcher (the notion of independence as autonomy is absent) - The disposition and practices of research are acquired through collaboration or engagement with a broader research environment

Each category of description is explored in turn below.

The skilled researcher

In the first category of description, researcher formation is conceived through the lens of independence conceptualised as a disposition, or a set of skills and attributes. In such accounts the role of others and the broader research environment are not explicitly mentioned.

> My PhD experience was what turned me into an independent researcher - critically appraising the literature; planning, carrying out research and analysing the results; writing papers for publication.

The skilled, autonomous researcher

In the category of the skilled, autonomous researcher, independence is equated with an experience in which the research skills and dispositions required for research are acquired by doing research 'on your own'. Comments suggest that this can occur either as a necessity, due to a lack of support; or by design, due to a deliberate approach by supervisors or the research program to researcher education. In both cases, the research context can be understood as 'acting on' the candidate in such a way as to either require the development, or impose the condition, of autonomy. However, there are distinct pedagogical differences at work between 'doing it on your own' by necessity – autonomy by neglect - or by design.

Autonomy by neglect

> My experience taught me to be independent and resilient. What I learned I learned myself, my primary supervisor was hostile and unwilling to extend herself at all for me (indeed she cost me time in the writing period).

In a second variation of doing research 'on your own' as a necessity the benefits of this autonomy are also recognised and valued:

> I was left to solve a great number of problems for myself. This developed independent problem solving skills. The relationship with my prime supervisor was quite conflictual -- this led to setting long-term goals, independent planning and a requirement to be very sure of all facts.

Autonomy by design

In a third conceptualisation the necessity of doing research 'on your own' is perceived as purposeful with entirely positive outcomes. In this conceptualisation, supervisors provide the opportunities for the fostering of autonomy:

> You have to be self-driven. My supervisor was wonderful, but he couldn't do it for me. In International Political Economy and International Relations, you just need that inner drive.

The skilled, collaborative researcher

In the third category, successful researchers conceptualise research formation without reference to independence at all. Instead, research skills and practices arise through either collaboration with others or engagement with a broader research environment. In such accounts research is conceptualised as a collaborative enterprise, in contrast with other accounts where skills are acquired by doing research 'on your own' or in an unspecified fashion.

> It was an apprenticeship of sorts: all aspects of research career development were included: writing proposals, getting published, doing research, getting used to the peer review system, seizing opportunities as they arise, debating concepts and politics within an academic research culture, and defending your work publicly.

Some respondents also emphasised the importance of peers in preparation for a research career:

> 95% of what I took away from graduate school was learned from other students and post-docs around me. This knowledge and understanding forms the foundations of a large fraction of my current research.

In these accounts of researcher formation, where the notion of independence is absent, an alternative to the figure of 'the autonomous scholar' emerges; the skilled, collaborative researcher.

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DISCUSSION

The findings presented here offer insight into the ways in which a cohort of successful mid-career researchers conceptualise independence with respect to a; reasons for their success, and b; the ways in which the PhD experience provides preparation for a research career. What do these findings tell us with respect to the role and significance of independence and creativity in research?

Our typology of successful researchers, with its six different permutations, suggest that while independence accounts for success to some extent, there are variations in the saliency of this category. Creativity and collaboration are also conceptualised as critical to success, in some cases to the exclusion of notions of independence. In other accounts, independence alone is deemed sufficient for success. Likewise, our three broad categories of description concerning the role of the PhD as a preparation for a research career also indicate variations in the ways independence is conceptualised and the contribution of the PhD experience to acquiring independence. Taken together, the responses indicate potentially confusing and unhelpful inconsistencies and contradictions in the various meanings attached to the concept of independence and its role in being and becoming a successful researcher. Independence is conceptualised in terms of learning to 'do it on your own' during the doctoral experience by some researchers. Others, however, appear to have acquired the necessary dispositions, skills and practices of a successful researcher in a qualitatively different way through mentorship, a dynamic and supportive research environment, and extensive networks and networking skills. Similarly, when it comes to being a successful researcher, independence is conceptualised as sufficient for success by some, while others attribute their success to a combination of independence, creativity and collaboration. Intriguingly, the end result – that of becoming a successful researcher – appears to be the same for all. Or is it?

In addressing this question it is first necessary to note that it is not possible to deduce which combination of practices is most effective in terms of research success as we have not sought to quantify the proportion of respondents who could be attributed to each category. The purpose of our analysis, instead, is to highlight the numerous combinations that were evident in the data. This is nonetheless useful, however, because it serves to problematize the notion of researcher independence – in both research training and successful research practice. It is noteworthy in this regard that independence as autonomy is absent from all but two of the categories of description concerning research success. In addition, the concepts of either collaboration or creativity are present in all but one category of description. This suggests that the practice of research autonomy is just one, potentially marginal, approach to successful research. It is far from innocuous, however, given the tendency of research education discourses and practices to conflate autonomy and independence.

As others have also observed, pedagogical practices during the doctorate – poor or otherwise – are reproduced in the research and educational practices of graduates (Lee & Williams, 1999; Walker et al, 2008). We need to ask, therefore, at what cost? What are the costs of researcher independence being treated as synonymous with autonomy? Moreover, while researchers can and do succeed despite less constructive (even damaging) practices and experiences during the doctorate, they can equally be positioned to succeed through deliberate pedagogical practices. In thinking about this, it is worth remembering that our research participants are the ones who while taking in some water readily learnt to swim. Others, some would argue too many, simply drown in the course of their doctoral experiences. Given that attrition rates from doctoral programs remain unacceptably high across the established research cultures of Australasia, Europe and North America, the 'sink or swim' model of doctoral pedagogy is clearly questionable (Lovitts, 2001; Golde, 2005; Walker et al, 2008).

Our findings also raise the question of the value of the model of the autonomous researcher given that there are other equally effective pathways to research success that do not demand self-sufficiency. Most significantly, if our findings are indicative then collaboration need not be viewed as experienced at the expense of independence. While success in research can be attributed in part to independence understood solely in terms of autonomy, it can also be attributed to creativity and/or collaboration or a combination of all three. This suggests that striving for independence when narrowly conceived as a capacity to work alone can be counterproductive to a creative and successful research career. What the study clarifies is that independence, in the dispositional sense, can be effectively acquired through collaboration – a perhaps counter-intuitive notion at first glance. Given the relationship between collaboration and creativity, this clarification may be particularly relevant for those seeking to advance creativity in research. It is interesting to note, in this regard, that the notion of independence has been more carefully formulated in the recently legislated Higher Education Standards Framework in Australia (TEQSA, 2012). Here, independence is defined as: "…critical and independent thought and the capacity for learning throughout life" (2011: 4). Unlike the notion of independence as autonomy, or

'doing it on your own,' such a conception emphasises a way of thinking rather than a way of working – either with or without others.

CONCLUSION

This chapter has examined the issue of the meaning and desirability of researcher independence. Our discussion raises a number of matters of relevance to doctoral education, particularly in regards to its pedagogy and aims. As we have argued, the residual emphasis on independence that is evident in conceptions of the purpose of doctoral education stand in tension with more recent calls for creativity and collaborative modes of research. This analysis suggests the need for a more sophisticated and inclusive understanding of independence as, in particular, not simplistically opposed to dependence, in doctoral education, and thus more consistent with networked and social conceptions of creativity.

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